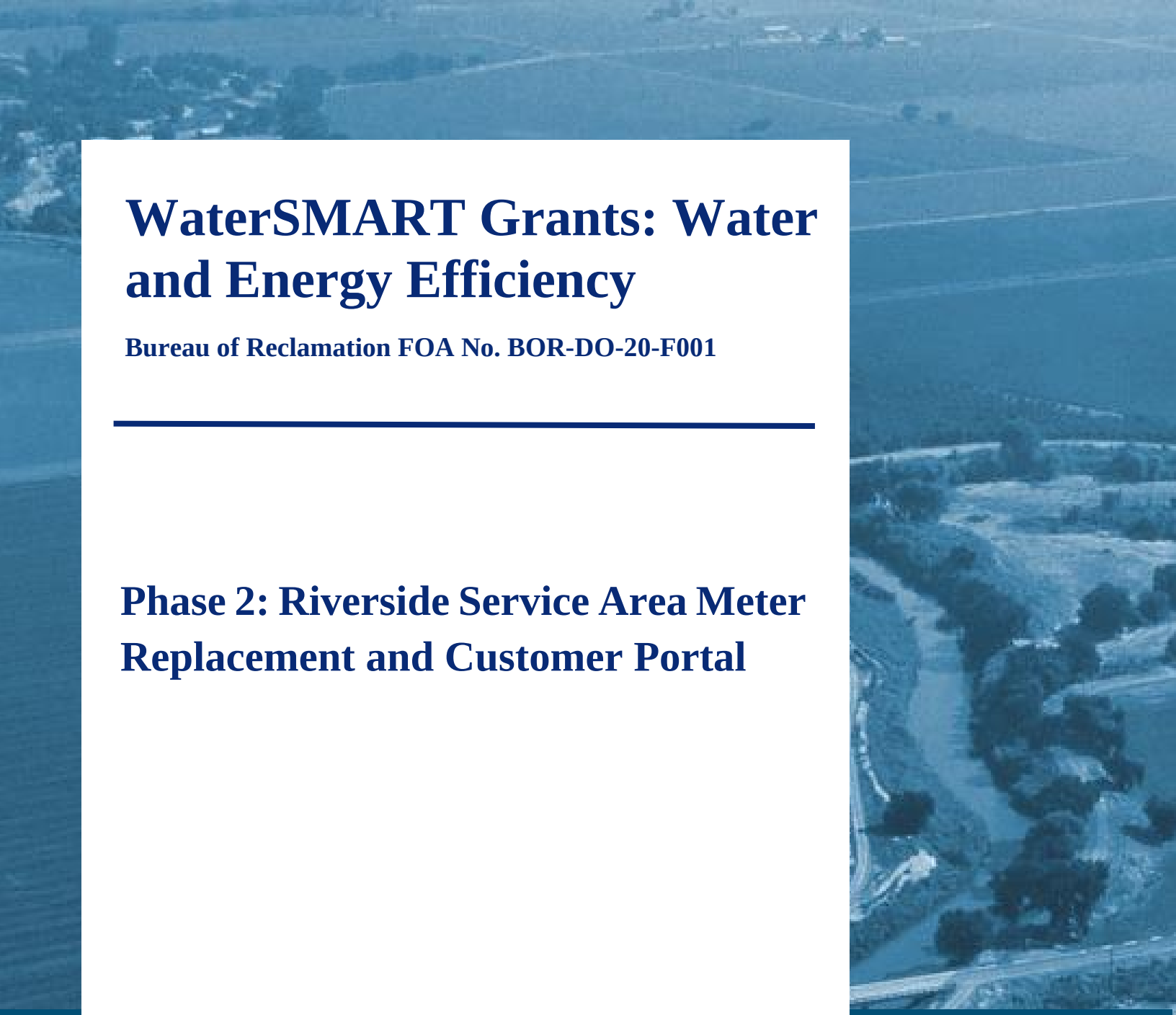


WaterSMART Grants: Water and Energy Efficiency

Bureau of Reclamation FOA No. BOR-DO-20-F001

Phase 2: Riverside Service Area Meter Replacement and Customer Portal

OCTOBER 2019

Western Municipal Water District
14205 Meridian Parkway
Riverside, CA 92518

Kevin Mascaro, Director of Finance
kmascaro@wmwd.com
(951) 571-7100

Table of Contents

Section 1: Technical Proposal

1.1 Executive Summary

Date: August 15, 2019
Applicant Name: Western Municipal Water District
Applicant City, County, State: Riverside, Riverside County, California
Project Title: Phase 2: Riverside Service Area Meter Replacement and Customer Portal

To reduce reliance on imported water, promote water sustainability, and address water loss, Western Municipal Water District (Western) will be pursuing an Advanced Metering Infrastructure and Customer Portal Project called Phase 2: Riverside Service Area Meter Replacement and Customer Portal (Phase 2, Project).

Western will be converting 7,008 of its meters that are 5 years and older to “smart” meters with advanced metering capabilities. Additionally, Western will be installing 5 Radio Antennas into Western’s Murrieta Service Area that will allow the collection of meter reads to be downloaded in Western’s system. Furthermore, Western will implement a subscription-based, hosted software application known generically as the “Customer Portal” which will integrate, analyze, and present meter data online to customers in near-real time. Advanced Metering Infrastructure (AMI) technology will automate meter reading, reducing vehicle emissions and maximizing work force efficiency related to manual meter reading, and allow the District to manage valuable water resources more effectively, reducing the reliance on imported water supplies. AMI will also enhance customer service by empowering customers with tools to monitor water usage, identify leaks, and maximize water use efficiency. The Customer Portal will be available to all customers with an AMI meter, over 17,000 connections.

The Phase 2 Project will result in quantifiable water savings and support broader water reliability benefits throughout the Riverside service area. The total annual project water savings are estimated at 1400 Acre-Feet per Year (AFY), 500 AFY due to leak detection and water loss and 900 AFY due to conservation, with a total lifetime savings of 21,000 AF. 70% of Western’s water imported comes from the State Water Project (SWP). The SWP is a water storage and delivery system that begins at Lake Oroville and transports water to customers throughout California. The 1400 AFY of estimated project savings tie directly into greater water reliability for Western Municipal Water District by decreasing the need for imported water.

The Project will begin September 2019 and will conclude June 2022.

The Project is not located on a Federal facility.

1.2 Background Data

Western's retail areas cover 104 square miles and serve water to an estimated population of 97,000. Western's retail service area includes the Riverside Service Area, Murrieta Service Area, and Rainbow Service Area. The Riverside Service Area, the main subject of this application, includes a portion of the City of Riverside as well as unincorporated portions of Riverside County, including areas known as Lake Mathews, Gavilan Hills, Woodcrest, Orangecrest, Mission Grove, Victoria Grove, and Lake Hills. Western is a member of three watermasters in the Santa Ana River Watershed and the Upper Santa Margarita River Watershed. Western receives 6000-8000 AFY in local groundwater supplies.

The project location can be seen on Figures 1, under section 1.3 Project Location. In addition to its retail water service, Western is the supplemental wholesale water supplier for eight other agencies in western Riverside County. On average, Western sells 75,000 acre-feet (AF) to its wholesale customers annually.

1.2.1 Water Supplies and Demand

From 2013 to 2017 Western used an average of 20,213 AF to the Riverside Retail Area. The average demand for the Murrieta Service area is over 2,000 AFY. By year 2040, retail demand for both Riverside and Murrieta is forecasted to increase by approximately 93 percent, to about 39,004 AFY. Ongoing drought conditions and associated water conservation efforts have resulted in demand decreases in recent years, however demand is anticipated to display a rebound effect when the drought subsides.

Retail water usage includes residential, commercial, industrial and agricultural. Among those uses, residential makes up nearly 52 percent and agriculture makes up approximately 9 percent.

Water resources available to Western come from three existing sources: groundwater, imported water and recycled water. The largest source for Western is imported water from the Metropolitan Water District of Southern California (Metropolitan), imported from the Bay-Delta, which makes up approximately 70 percent of Western's total supply. From 2013 to 2017, imported Metropolitan supplies to the retail area average 25,889 AFY. Of the imported supplies from Metropolitan, about one quarter comes from the Colorado River Aqueduct and about three quarters comes from the State Water Project (SWP). Western retail and Western's wholesale agencies have access up to 100,000 AFY of Metropolitan Water under its Tier 1 agreement.

Western's 2015 Urban Water Management Plan (UWMP) shows that with continued focus on water use efficiency, water supplies are anticipated to be adequate in all water year types (normal, wet, and dry years), based on existing and planned water supplies. With 70% of Western's water supplies being imported, potential supply shortfalls can arise from disaster scenarios, like a large earthquake that

disrupts the SWP supply systems. By decreasing the imported water through this project, Western is increasing its water supply reliability.

1.2.2 Water Delivery System

Western's Riverside Service Area dates to the mid-1950s, has 23,654 connections and serves approximately 97,000 persons. The water meters targeted for replacement or retrofit in this Phase 2 Project are typically more than 5 years old.

In 2016, Western prepared a water loss audit consistent with the American Water Works Association (AWWA) Manual 36 methodology. This audit found that Western's total retail sector water losses amounted to approximately 15 percent of total retail water use, or over 3,032 AFY in the Riverside area. The installation of AMI technology proposed by Western will help address water losses and water use inefficiencies resulting from current metering issues. While drought-related conservation actions have resulted in demand reductions in recent years, the reductions are anticipated to decline again once drought conditions improve. In contrast, the proposed project will result in long term water use efficiency improvements needed to better manage demands.

1.2.3 Past Working Relationship with Reclamation

Western has received grant funds from various Reclamation grant programs in the past. In June, 2007, Western received Challenge Grant funding for its Water Conservation Demonstration Project (Assistance Agreement 07FG350222). This grant consisted of two projects aimed at reducing outdoor water demand. One project focused on reducing commercial, institutional, and industrial outdoor water by retrofitting high water users identified in Western's Murrieta retail area with high-efficiency sprinkler nozzles and weather-based irrigation controllers. Seven large landscapes and the high users in Murrieta participated in the grant program. The other project resulted in the creation of "Gardening for the Inland Empire," a user-friendly CD-ROM for residential customers. The CDs received rave reviews. A press release promoting free CDs to residential households was issued on January 7, 2009.

In March 2009, President Barack Obama signed a bill authorizing the Bureau of Reclamation to participate in the design and construction of the Riverside-Corona Feeder, proposed by Western. The Riverside-Corona Feeder is a pipeline that provides new groundwater pumping capacity and new delivery pipeline capacity. The new pumping and delivery capacity enables new water supplies from local runoff and excess imported water to be stored safely in local groundwater basins by providing the means to control water tables. When pumped, the water will be delivered to communities in western Riverside County. The project will include 20 wells and 28 miles of pipeline capable of moving 40,000 AFY of groundwater in and out of storage in the San Bernardino Basin Area. The assistance agreement, R10AC35281, was used to design a the La Sierra Pipeline portion of the Riverside Corona Feeder and assistance agreement R16AP00023 is providing a portion of the funding to construct the La Sierra Pipeline. Design has been completed. Construction was completed over the summer of 2019.

In 2013, a WaterSMART Water and Energy Efficiency Grant was awarded to Western to fund the High Efficiency Urinal Flush-Valve Upgrade Project (Assistance Agreement R13AP35370). Under this direct install program, an estimated 123 AFY of water will be conserved through the installation of 2,000 high-efficiency flush valves throughout Western's wholesale service area. This project is complete.

In 2015, Western was awarded a WaterSMART Water and Energy Efficiency Grant for the Arlington Water Quality Improvement project (Assistance Agreement R15AP00140). The Arlington Basin Water Quality Improvement Project focused on expanding potable water production at the Arlington Desalter and improving overall water management. The project consisted of the construction of a recharge basin, an extraction well, and a raw water pipeline connecting the extraction well with the Arlington Desalter. The project facilitates recharge of currently unused or underutilized local water resources, including stormwater and dry-weather flows. The additional groundwater recharge allows increased extraction and treatment at the Arlington Desalter while providing the facilities for prudent conjunctive management of sustainable and reliable groundwater levels. This project is complete.

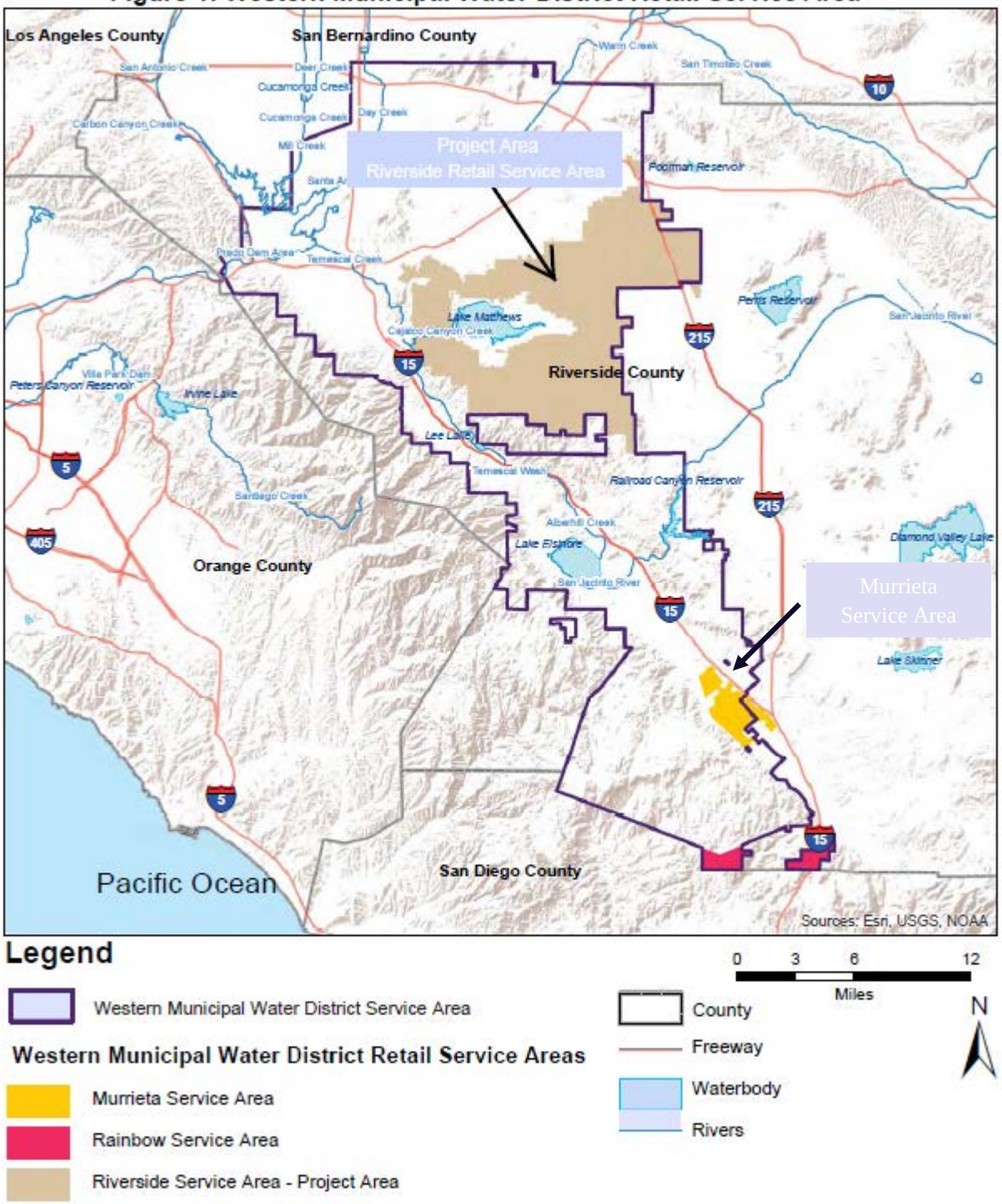
In 2019, Western was awarded a CALFED Water Use Efficiency Grant for Phase 1 of the Meter Replacement and Retrofit for the Riverside Service Area. The Phase 1 Project is an effort to increase water use efficiency and reduce water loss through the installation of AMI at over 10,000 domestic connections or about one-half of Western's system. This grant was completed and the final report was submitted June 2019.

1.3 Project Location

Phase 2: Riverside Service Area Meter Replacement and Customer Portal (Project) is located in Riverside County, California, approximately 100 miles North of San Diego, approximately 75 miles east of the Pacific Ocean, and approximately 180 miles west of the Arizona border. The center of the service area was selected in the middle of the 104 square mile area in Western's Retail Service Area with a latitude of 33.858 and a longitude of -117.359.

Figure 1, a map of Western's Retail Service Area, is shown below.

Figure 1: Western Municipal Water District Retail Service Area



1.4 Technical Project Description

1.4.1 Project Need and Background

Western has been experiencing significant demand increases within its service area over the last decades and, despite aggressive conservation programs, demands in the Western retail service area are anticipated to increase by approximately 93% from 20,213 AFY to about 39,004 AFY over the next 25 years. Water supplies available to Western include imported water, groundwater and recycled water. Imported water purchased from Metropolitan makes up the largest proportion at 70 percent of total water supplies. Western recognizes that improving water use efficiency is critical to better managing demands and supplies and reducing impacts on imported water supply that has low reliability from which the majority of Western's supply is derived.

In its retail service areas, Western provides water service to nearly 24,000 connections, all of which are metered. The majority of Western's meters are associated with domestic accounts with meters ranging in size from 3/4 -inch to 1-inch. The service meters, however, vary widely in age and reflect a variety of reading technologies; the majority require onsite meter reading. Numerous common inefficiencies are associated with these aging meters, including inaccurate meter readings, an inability to automatically detect leaks, and the use of substantial resources to conduct on-site meter readings and data analysis. The monthly meter reading conducted for these existing meters is not conducive to detecting leaks or unusual water usage in a timely manner. Unless customers personally monitor their water use and record their meter readings, leaks may go undetected until the next meter reading, or until a customer receives an unusually high water bill. Many low flow leaks may still go undetected under normal circumstances as they will not be apparent from water billing data. Further, it is difficult for customers to gauge whether or not their water conservation efforts have been effective until meter reading data has been collected and they receive their bill. The inaccuracy of the meters also contributes to under-billing and a higher portion of water being unaccounted for.

In 2016 Western prepared a water loss audit consistent with the American Water Works Association (AWWA) Manual 36 methodology. This audit found that Western's total retail sector water losses amounted to approximately 15 percent of total retail water use, or over 3,032 AFY in the Riverside area. The installation of AMI technology proposed by Western will help address water losses and water use inefficiencies resulting from current metering issues. While drought-related conservation actions have resulted in demand reductions in recent years, the reductions are anticipated to decline again once drought conditions improve. In contrast, the proposed project will result in long term water use efficiency improvements needed to better manage demands.

1.4.2 Project Description, Activities, and Implementation Schedule

Western's proposed Project will install meter replacement and retrofit with AMI technologies at 7,008 sites within the Riverside Service Area that are 5 years or older. Western will also purchase and install 5 antennas for the Murrieta Service Area**,** which meters currently have Neptune AMI equipped radios

(not Long Range, LoRa). The five antennas will allow Western to pick up daily reads and add the Murrieta service area to our total customers/accounts that could access daily usage data. Lastly, the Phase 2 Project will provide Riverside customers with AMI and the Murrieta Service Area customers with a Customer Portal, allowing the customer to manage and track their own usage.

These replacements and retrofits in Phase 2 would cover about 35 percent of the meters within the Riverside Service Area, bringing the total of AMI/AMR meters in the service area up to 85%. Both the new meters and retrofitted meters would be able to automatically transmit data using a cellular network, thereby eliminating the need for manual, on-site or drive-by meter reading along the targeted routes. The remaining meters, approximately 3,000 meters, are under 5 years old. Western determined that replacing these meters at this time would not be a good use of rate-payer funds. The remaining meters will be replaced when they age out.

Equipment to be installed will include ¾ inch and 1-inch water meters (for replacements), meter endpoints (for retrofits) and meter box lids. Neptune LoRa meters will be used for this Project. Neptune will also provide the data collection infrastructure, thereby avoiding the need for Western to purchase, install or maintain data collection towers.

The process leading up to the identification of the proposed Project has consisted of three phases to date. The first phase consisted of accuracy testing of 300 randomly selected meters and an analysis of the testing data. The analysis results revealed that meter age strongly correlated with the loss of accuracy and helped pinpoint the optimal age for replacement at 15 years. Next, meter reading technologies available to Western were reviewed, including manual read, touch read, automatic meter reading, and AMI.

The meter reading technology in this proposal was deemed the best alternative, particularly with the establishment of a partnership between Neptune and Senet to produce a long-range transmission-based meter and data collection network. Finally, all meters in the Riverside Service Area were analyzed for age, meter type, and location. Results helped design a replacement/retrofit plan that identified quantity and location of meters to be replaced. Two phases, based on the age of the meters, were determined to be the best replacement approach.

In January 2018, a total of 100 meters were installed in the Orangecrest portion of the Riverside Service Area. The AMI Pilot had a couple of purposes: (1) to start with a small volume of data and make sure the necessary data processing is streamlined before the larger rollout of AMI when large volumes of data will be received and (2) identify which parts of the Western organization is affected by the smart metering and make sure all affected have appropriate training. Preliminary results of the Pilot Study showed that 20% of these homes had some degree of a leak.

Phase 1 meter replacements and retrofits identified replacement of 10,645 sites that were 15 years or older. Phase 1 involved replacing 7,517 meters with a ¾" Neptune meter, 2,679 meters with a 1" Neptune meter, retrofitting 449 meters with a new integrated register and radio, and 10,645 meters getting a lid replacement to accommodate the transmitter. Phase 1 began in April 2018. Full implementation was completed by May 31, 2019.

MC Engineering, Inc. (MCE) provided Western with analysis and design support in relation to Phase 1 Project. MCE has assisted with creating installation routes, managing project schedule, and tracking project progress.

Phase 2, which will begin installation in 2020, will replace meters over the age of 5 years old with AMI technology. The remaining meters, under 5 years old, will be replaced when the meters age out.

Murrieta's Service Area is a newer service area for Western and already has AMI meters integrated into their system. However, those meters have Neptune AMI equipped radios (not LoRa). By purchasing 5 antennas for the Murrieta Service Area, Western will be able to pick up their daily reads and provide those customers access to the Customer Portal. This access will allow Western and the customers to monitor daily flows and reduce the lead time for evaluating problems, thereby improving the amount of water lost to leaks.

The proposed meter replacements and retrofits will help increase water use efficiency and improve water management in Western's service area, specifically in the Riverside Service Area. Water savings will result by (a) improved accuracy of water metering, (b) facilitated leak detection and more transparency of water meter data, as well as (c) enhanced customer awareness.

(a) Meter Reading Accuracy and Automation

Smart meters have exceptional accuracy at low to high flow conditions, thereby enabling Western to bill customers more accurately according to use and preventing under or overbilling. This accuracy is also critical for detecting leaks.

Meter reading of the older manual-read meters is a labor-intensive effort requiring Western staff to physically read meters on-site along numerous routes on a monthly basis. The AMI system will have fixed base antennas which allows meters to be read remotely and automatically collect and transmit water usage data.

The automation will reduce errors from manual readings, improve meter reading accuracy, and reduce use of resources, including staff time and fuel for vehicles related to manual meter readings.

(b) Data Transparency and Water Waste Detection

One of the primary benefits of the proposed project is the ability to more easily identify water leaks. With the proposed meter upgrades, Western will have real-time water use data. The AMI systems will transmit hourly water consumption data via a wireless network to Western's customer service center four times a day. The improved transparency of water usage will alert staff of potential leaks, over-usage or other inefficiencies in the system. Real-time water consumption data will show sharp spikes in usage or unusual continuous use if a leak is present indicating small leaks or possibly a catastrophic pipeline break. With this type of transparency, Western can more easily locate leaks, alert customers of the issue, and save both money and water. This can also prevent customers from receiving large water bills due to undiscovered leaks in their water system.

(c) Customer Portal

AMI meters transmit hourly water meter readings to the Water Agency. By partnering with a company to host a Customer Portal, Western's customers also gain access to their hourly readings. Western customers will not have to wait until their monthly bill comes to know how much water they are using. Customers can see real-time hourly usage from an internet portal.

Once the portal has been created, customers will be able to view and track their own detailed water usage to help identify unusual spikes in water usage, and continuous flow associated with potential leaks.

Customer portals also allow critical and non-critical communications between Western and their customers. Customers can get easier access to Western's conversation programs like rebates. Customers can also track their usage compared to their water budget. Portals arm customers with data and their information drives their usage change and their water savings. Long-term behavior change can occur when customers have this type of interactive access.

Tasks/Milestones

Project activities and project schedule are described below.

Proposed Activities

Task 1 – Environmental Documentation/Permitting

Western has determined that activities of the Riverside Service Area Meter Replacement and Customer Portal do not constitute a "project" under the California Environmental Quality Act (CEQA). Based on review of Reclamation's NEPA Handbook (February 2012), this project will qualify for a categorical exclusion under the National Environmental Policy Act (NEPA) and does not involve ground-disturbance. Western also evaluated potential permits needed for the project and determined that replacing water meters with a similar piece of equipment did not require permits.

Task 2 – Cost and Feasibility Studies

Western formed a multidisciplinary Water Loss Task Force in 2011 to analyze and try to reduce the amount of unbilled water, and to account for other water that may be legitimately used but was not being tracked. This task force identified that meter failures were a significant contributor to water loss and determined that the accuracy of meters and the accuracy in reading meters would be a decisive factor to reducing water loss over time.

Staff pulled meter information from the billing system and randomly selected a valid sample of 300 meters of various sizes, locations, and ages. Western then contracted with Mountain States Pipe to remove all 300 of these meters (and replace them with new meters) and sent the old meters to a facility where they were tested for accuracy using AWWA test standards. The results of these tests, along with information from the remainder of the meter inventory, were then analyzed both by Western staff and by MC Engineering. Concurrently the Water Loss Task Force began examining different meter technologies. AMI was deemed optimal in comparison with other metering technologies available to Western.

Following these activities, MC Engineering then prepared a report for Western that analyzed the meter test results, developed costs for meter replacement, developed costs for AMI implementation, and provided recommendations of how to implement AMI in the Western retail area. The Water Loss Task Force then developed a replacement and retrofit plan for the Riverside Service Area based on analysis of meter age, type, and location. Those meter reading routes that would most benefit from AMI (e.g., hilly, routes with mostly older meters) were identified and have priority for AMI installation. Information from this work will continue to guide implementation sequencing. Cost and feasibility studies were previously completed and are not included in the project budget of this application.

Task 3 – Contracting

Western solicited bids for meter installation and retrofit services in July 2017. Golden Meter Services, Inc. was selected for meter installations for Phase 1. Similar with Phase 1, Phase 2 is a public works project. Western will have to publicize a bid document and award the contract to the lowest responsive bidder. This grant application uses quotes from our current Phase 1 installer as a placeholder in the Phase 2 project budget, and the budget may need to be revised based on which vendor is awarded the work. However, there is no concern among staff that the project costs will still exceed the required 50% cost share requirements. Project bidding, for construction and project management activities, will begin in the Fall of 2019.

Task 4 – Phase 2 Construction and Project Management

Phase 2 meter replacements will occur for 7,008 sites that are 5 years or older. Phase 2 involves replacing 5,770 meters with a ¾” Neptune meter, 1,238 meters with a 1” Neptune meter, and 7,008 meters getting a lid replacement.

Installation of the meters is expected to begin January 2020. Full implementation of Phase 2 meters is anticipated to be completed by February 2022.

In addition, Western will track project progress and conduct oversight to ensure successful project implementation. Western will also perform regular reporting in compliance with the Bureau funding agreement.

Task 5 – Customer Portal

Customer Portals that are partnered with Advanced Metering Infrastructure take customers' hourly usage and allow the customers to have access to that data. A good customer portal is web-based, interactive, and has easy-to-read charts, graphs, billing estimates, tips, and more. Portals put the customer's data at their fingertips and provide greater customer control over their water usage.

Research is still being conducted to identify the company that will host the customer portal. Companies of interest are DropCountr, Advanced, and Harris Smartworks. Western will select the portal based on the findings of the Water Use Efficiency Master Plan. During the grant period, Western will enter into an agreement with the company, pay to get the system set-up, and pay the annual subscription fees. The fees in this grant application are based on quotes from DropCountr. Final costs have not been determined for the portal. However, there is no concern among staff that the project costs will still exceed the required 50% cost share requirements.

Task 6 – Outreach Materials

Western has developed an outreach plan that will target all affected customers, Western staff, and the Western Board. Phase 1 involved designing a letter informing impacted customers about the upcoming meter replacement/retrofit including a project timeline, what to expect during installation, a phone number for any questions, and designing a website that provided FAQs, AMI benefits, and potential impacts to the customer during meter installation.

Specific tasks to be implemented as part of outreach for Phase 2 include:

- Mailing a letter informing impacted Phase 2 customers about the upcoming meter replacement including a project timeline, what to expect during installation, a website and phone number for any questions.
- Door hangers for impacted Phase 2 customers
- Printing of bill inserts describing the AMI process for Phase 2 customers
- Development of print collateral regarding the Customer Portal

Implementation Schedule

Table 1.1 Phase 2: Riverside Service Area Meter Replacement and Customer Portal

	Task	Begin Date	End Date
1	Environmental Documentation/ Permitting	Not Applicable	
2	Cost and Feasibility Studies	Complete	
3	Contracting – Phase 2	9/1/2019	12/31/2019
4	Phase 2 Construction and Project Management	1/1/2020	02/28/2022
5	Customer Portal	1/1/2020	6/30/2022
6	Outreach	1/1/2020	6/30/2022

1.5 Evaluation Criteria

1.5.1 Evaluation Criteria A: Quantifiable Water Savings

1.5.1.1 Estimated Water Savings

Describe the amount of estimated water savings. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.

Total annual project water savings are estimated at 1,400 AFY: 500 AFY due to leak detection and water loss and 900 AFY due to conservation. These estimates are based on the following:

Water Savings Related to Water Loss = 500 AFY

There is about 5,053 AFY water demands in the project area, which is one-fourth of total Riverside Service Area demand. Expected water savings is approximately 10 percent.

- 5,053 AFY * 0.1 = 505.3 AFY

Water Savings Related to Conservation = 900 AFY

About 86% of Western customers will now have AMI after the completion of Phase 2 and access to a Customer Portal, including the Murrieta Service Area. 86% of the retail service area demands for 2018 was 18,385 AFY. Water savings related to conservation due to a Customer Portal is estimated at 5%.

- 18,385* 0.05 = 919 AFY of water supplies saved due to conservation

The meter infrastructure has a useful life of 15 years. Therefore, total water savings over the life of the project is 1,400 AFY*15 = 28,000 AF.

Table 1.5.1 Quantifiable Water Savings

Method of Conservation	Water Savings
Water Loss Related Savings	500 AFY
Conservation Related Savings	900 AFY
Total Annual Water Savings	1400 AFY
Total Estimated Lifetime Water Savings	28000 AF

1.5.1.2 Current Losses

Please explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?

The estimated 500 AFY that will be conserved after this Project is completed currently is water loss due to leaks or broken meters. Currently, the water loss seeps into the ground or runs off into storm drains.

1.5.1.3 Supporting Documentation for Savings

Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal. In addition, please note that the use of visual observations alone to calculate water savings, without additional documentation/data, are not sufficient to receive credit under this section. Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.

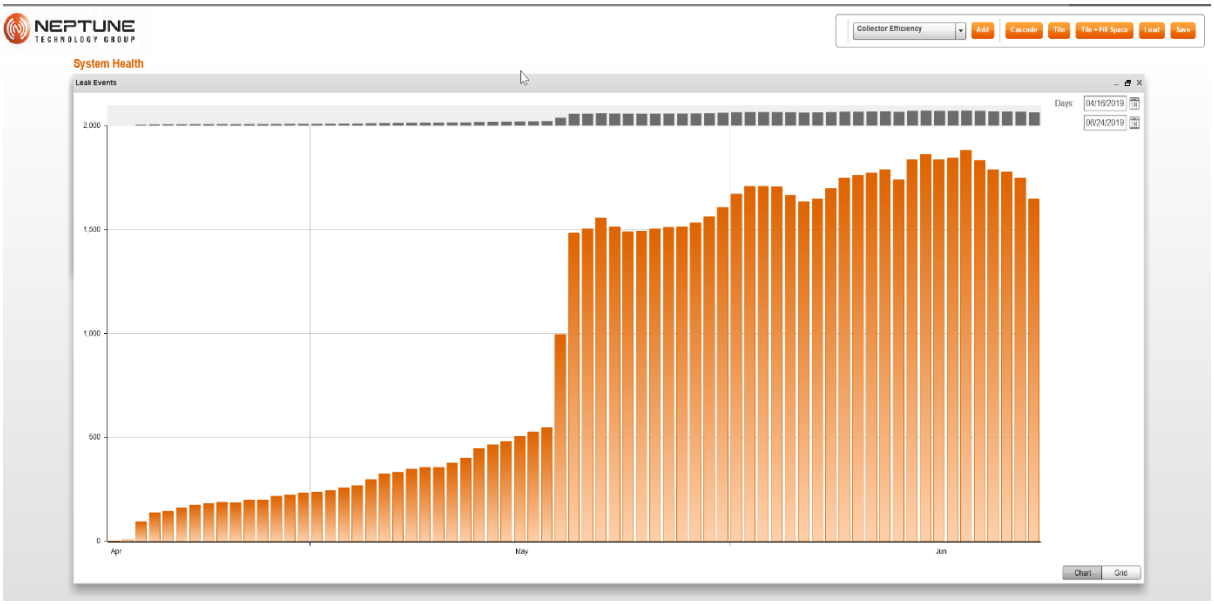
Water Loss

According to Western's 2015 UWMP (2016), distribution system water losses in Western's retail sector make up 15 percent of total retail water use. Further, according to the EPA, it is estimated that 75 percent of average system water losses are recoverable (EPA 2013[1]). This means, approximately 11 percent of Western's system water use could be saved through improved water loss control.

According to a 2013 paper in the Journal of Environmental Management, which explores the impact of customer-specific water use information on consumption patterns, daily consumption data from smart water meters can reduce water consumption by an average of 9% (Fielding 2013[2]). Additionally, a 2014 pilot study at East Bay Municipal Utility District (EBMUD), which supplies water throughout the San Francisco East Bay, installed water AMI systems that provided hourly water consumption data to customers through an online web portal. EBMUD found water savings between 5-50%, with an average of 15%, among residential customers after the installation, while noting that some of these savings are likely due to customer-side leak repair (EBMUD 2014[3]). Another recent report by Water Research Foundation, "Residential End Uses of Water, Version 2", found that leaks account for 13% of all residential indoor water consumption across the U.S. (DeOreo 2016[4]). According to Los Angeles County Waterworks, staff polled other agencies and consultant experience and determined that a robust AMI system is estimated to achieve a 10% reduction in per capita water consumption. When investigating other water utilities that have implemented AMI technology, it is evident that there are significant benefits from this type of implementation.

In Western's pilot project, 20% of the customers were indicating a leak. Western's Phase 1 of the AMI project completed installation of 10,196 AMI meters by May 31, 2019. As of June 24, 2019, all meters were reporting to the online system and Western staff could start looking at hourly reads. With the AMI Meter's reporting capabilities, Western staff used the Neptune platform to see when leak events (constant water flow for 3 days or longer) are occurring. Figure 2 shows how many meters registered leaks once meters started coming online in April. From this, we can see that there are over 1,500 meters reporting a leak event, which is about 14% of the new meters installed. Based on the leak events in Figure 2, Western staff was able to further digest the data and learn that the number of customers who had a leak event had an average of 24 days in a leak state. This current report does not state what the amount of the leak is. Deciphering the amount of the leak will be solved through a customer data portal and data management system proposed in this application. In addition, Western staff are finding new ways to view the reporting and are using the guidelines in Western's Strategic Communication Master Plan to develop the best protocol to communicate leaks with the customer and reduce water loss due to leaking.

Figure 2: Number of Leak Events from April 16, 2019 – June 24, 2019.



The difficulty with most public agencies deciding to install AMI meters to their customers is that there has not been a consensus on how much water could be saved through implementation. There have only been a few case studies and a majority of the case studies are not representative of Western's service area. The closest in representation is the Los Angeles County Waterworks, a member agency of Municipal Water District of Southern California, same as Western, conducted informal study stating on average 10% of water loss was recovered through AMI implementation. Therefore, a conservative estimate, Western is estimating 10% of the retail total use for the Project 2 area and corresponding water loss results in water savings from implementing AMI.

Conservation

Dropcountr studies[5] analyzed water usage after implementing a Customer Portal and found 7.5% aggregate water savings at Denver Water, 9% at Austin Water, and 6% at City of Folsom. A case study performed by IBM Research and published by Hanes, D[6]. (2013), Every drop counts: How water utilities are putting water efficiency first, found that informed, engaged, and incentivized citizens, through use of a customer portal, conserved an average of 6.6 percent more water than those with standard billing procedures. Again, the difficulty with most public agencies deciding to provide a customer portal their customers is that there has not been a consensus on how much water could be saved through conservation messaging, leak detection, and rebate media messaging that are benefits of a Customer Portal. There have only been a few case studies and a majority of the case studies are not representative of Western's service area.

In Western's monthly Conservation Monitoring Report through the State Water Resources Control Board, Western's water use is already on average 17% less per month than the same months in 2015 and 2013. In addition, Western's GPCD is less than the 2015 UWMP targets. With water conservation a high goal for Western, there have been a large amount of conservation media and marketing, potentially saturating our customers. Therefore, although the previous studies report between 6-9% for water savings related to a Customer Portal, a conservative estimate of 5% was used in these calculations.

Calculations for Water Savings is listed below.

Water Savings Related to Water Loss = 500 AFY

- 5,053 AFY water demands in the project area (one-fourth of total Riverside Service Area demand)
- 10 percent annual water savings from project implementation.
- 5,053 AFY * 0.1 = 505.3 AFY

Water Savings Related to Conservation = 900 AFY

- 5 percent aggregate conservation based water savings.
- Total connections not under AMI =2,418 or 10% of Western's Retail customers
    - 21,135 connections in Riverside Retail, 2,681 connection in Murrieta Retail.
- Average water usage in Western's Retail area is 21,378 AFY for 2018.
- Usage related to the Customers with AMI = 21,378*0.86 = 18,385 AFY
- 18,385* 0.05 = 919 AFY of water supplies saved due to conservation

[1]EPA. 2013. Water Audits and Water Loss Control for Public Water Systems. (Study Attached)

[2]Fielding, K., Spinks, A., Russel, S., McCrea, R., Stewart, R., & Gardner, J. 2013. An experimental test of voluntary strategies to promote urban water demand management. Journal of Environmental Management. Volume 114, Page 343-351. DOI: https://doi.org/10.1016/j.jenvman.2012.10.027

[3]EBMUD. 2014. Advanced Metering Infrastructure Pilot Studies Update. (Presentation Attached)

[4]DeOreo, W., Mayer, P., Dziegielewski., and Kiefer, J. 2016. Residential End Uses of Water, Version 2. Water Research Foundation. (Study Attached)

[5]Krishnamurthy, G., Nemati, M. Using data to drive customer communication and engagement. Dropcountr. (Presentation Attached).
[6]Hanes, D. 2013. Every drop counts: How water utilities are putting water efficiency first. Journal AWWA. Volume 105, Issue 6, Page 78-81. DOI: https://doi.org/10.5942/jawwa.2013.105.0077

1.5.1.4 Municipal Metering Specific Criteria

How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

Total annual project water savings are estimated at 1,400 AFY: 500 AFY due to leak detection and water loss and 900 AFY due to conservation. The meter infrastructure has a useful life of 15 years. Therefore, total water savings over the life of the project is 1,400 AFY*15 = 21,000 AF.

Water Savings Related to Water Loss = 500 AFY

- 5,053 AFY water demands in the project area (one-fourth of total Riverside Service Area demand)
- 10 percent annual water savings from project implementation. Conservative savings estimate, based on 15 percent total annual water losses and 75 percent potential loss recovery.
- 5,053 AFY * 0.1 = 505.3 AFY

Water Savings Related to Conservation = 900 AFY

- 5 percent aggregate conservation-based water savings. Conservative estimated based on Dropcountr studies that analyzed water usage and found 7.5% aggregate water savings at Denver Water, 9% at Austin Water, and 6% at City of Folsom due to the implementation of Customer Portal.
- Total connections not under AMI =2,418 or 10% of Western's Retail customers
    - 21,135 connections in Riverside Retail, 2,681 connections in Murrieta Retail.
- Average water usage in Western's Retail area is 21,378 AFY for 2018.
- Usage related to the Customers with AMI = 21,378*0.86 = 18,385 AFY
- 18,385* 0.05 = 919 AFY of water supplies saved due to conservation

How have current distribution system losses and/or the potential for reductions in water use by individual users been determined?

In 2016 Western prepared a water loss audit consistent with the American Water Works Association (AWWA) Manual 36 methodology. This audit found that Western's total retail sector water losses amounted to approximately 15 percent of total retail water use, or over 3,032 AFY in the Riverside area.

For installing individual water user meters, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of

such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.

According to Western's 2015 UWMP (2016), distribution system water losses in Western's retail sector make up 15 percent of total retail water use. According to the EPA, it is estimated that 75 percent of average system water losses are recoverable (EPA 2013). This means, approximately 11 percent of Western's system water use could be saved through improved water loss control. There have only been a few case studies and a majority of the case studies are not representative of Western's service area. The closest in representation is the Los Angeles County Waterworks, a member agency of Municipal Water District of Southern California, same as Western, conducted an informal study stating on average 10% of water loss was recovered through AMI implementation. For purposes of this application, it is conservatively assumed that implementation of the proposed AMI will result in 10 percent annual water savings for targeted customers.

Findings in other studies, like East Bay Municipal Utility District (study attached), found a savings related to leak detection from their AMI installation of 15%. In addition, Western's pilot project, 20% of the customers were indicating a leak for 4 days straight. From verbal communication, Rancho California Water District (RCWD), one of Western's wholesale agencies, is expecting to recover over $8 million in revenue over 5 years and stop over 200 AF of water annually.

Dropcountr studies (study attached) analyzed water usage after implementing a Customer Portal and found 7.5% aggregate water savings at Denver Water, 9% at Austin Water, and 6% at City of Folsom. In addition, a case study performed by IBM Research and published by Hanes, D. (2013), Every drop counts: How water utilities are putting water efficiency first, found that informed, engaged, and incentivized citizens, through use of a customer portal, conserved an average of 6.6 percent more water than those with standard billing procedures. Again, the difficulty with most public agencies deciding to provide a customer portal their customers is that there has not been a consensus on how much water could be saved through conservation messaging, leak detection, and rebate media messaging that are benefits of a Customer Portal. There have only been a few case studies and a majority of the case studies are not representative of Western's service area.

The previous subsections also detail the assumptions in the calculations, including examples from Western's Phase 1 AMI program.

If installing distribution main meters will result in conserved water, please provide support for this determination (including, but not limited to leakage studies, previous leakage reduction projects, etc.). Please provide details underlying any assumptions being made in support of water savings estimates (e.g., how leakage will be reduced once identified with improved meter data).

Distribution main meters will not be installed in this project.

What types (manufacturer and model) of devices will be installed and what quantity of each?

Equipment to be installed will include ¾ inch and 1-inch water meters (for replacements), meter endpoints (for retrofits) and meter box lids. Neptune R900i LoRa meters will be used for this Project. Neptune will also provide the data collection infrastructure, thereby avoiding the need for Western to purchase, install or maintain data collection towers.

5,770 meters (size ¾"), 1,238 meters (size 1"), and 5 antennas will be installed for this Phase 2 project.

How will actual water savings be verified upon completion of the project?

Western has a monitoring plan that will capture, verify, and document the project benefits. Specifically, Western will track:

- Overall Water Savings. With project implementation, Western will be able to monitor real time water use and review usage trends. Total water savings resulting from project implementation will be quantified by comparing water meter consumption data from each newly installed or retrofitted AMI meter, with historical water meter data for the same customers. Post-implementation water savings will be based on average water use over a one-year period upon implementation. Historic water use data will be appropriately normalized by accounting for water use trends over the past 5-year period and accounting for conservation measures implemented in response to ongoing drought conditions and statewide water use reduction mandates of 2015. Water use savings data will also be compared to control groups of customers that did not receive AMI meter upgrades or replacements to increase robustness of results. This analysis will allow Western to calculate the actual amount of water saved because of project implementation.

- Water Savings from Leak Detection. Western will also compile and analyze data related to water savings from early leak detection. One of the important benefits of the AMI system is that it can provide real time data in combination with high accuracy of high and low flows, which facilitates early leak detection. In addition, alerts are triggered by unusual water usage that may indicate leaks. The majority, if not all, of these leaks would be unaccounted-for water losses and are generally difficult to quantify. Western will track the number of alerts triggered, related amounts of water that resulted in the alert, and related responses. Using this information, Western will be able to estimate what proportion of total water savings is made up of early leak detection savings.

- Water Savings from Consumer-Side Conservation. Another important benefit of AMI in particular, is a user-friendly water use data portal, allowing water customers to more easily view and track water usage. This accessibility of water use data can result in self-leak detection and water use behavioral changes. Western will analyze water use reductions to estimate customer-side

conservation as a portion of total water savings. Western can track this behavior by comparing a 'before and after' per capita water use, normalizing data for other post-project savings, such as leak detection. In addition, Dropcountr's scope of work also includes water saving analysis.

1.5.2 Evaluation Criteria B: Water Supply Reliability

1.5.2.1 Specific Water Reliability Concern

Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries. Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?

Western's sources of supply are imported water purchased from Metropolitan and groundwater, both purchased local groundwater, and groundwater locally developed by Western. Western is located in Southern California, in the Santa Ana Watershed. Both sources are constrained in one or more ways, driven by climatic and hydrologic conditions, water quality, and legal restrictions, as well as potential for interruption of supply driven by catastrophic events.

Local Groundwater

In its climate change vulnerability analysis, the Santa Ana River Watershed IRWMP identified the key supply vulnerabilities to climate change as the following:

- Insufficient local water supply
- Increase dependence on imported supply
- Inability to meet water demand during droughts
- Shortage in long-term operational water shortage capacity

The U.S. Bureau of Reclamation's, Climate Change Analysis for the Santa Ana River Watershed, indicates that there is likely to be an increase in average temperature and a decrease in average precipitation over the next century, leading to a decrease of up to 15 percent of the flow in the Santa Ana River. The expected increase in temperature and decrease in precipitation may also lead to increased groundwater pumping and decreased groundwater recharge, leading to an overall decrease in groundwater levels.

Although Western's service area is within the Santa Ana River Watershed, the Agency's supply is unlikely to be substantially affected by a decrease in local surface water supply because it relies on imported water and groundwater. Thus, a decrease in groundwater level or in imported supply reliability may negatively impact Western's ability to meet demand.

Threats to groundwater supply reliability include:

- Overdraft: Under extended supply pressures, groundwater basins can enter overdraft conditions, which can have a series of consequences including subsidence. Overdraft can also exacerbate or create water quality issues by reducing the assimilative capacity of the basin or requiring wells to tap into lower quality water that may be present in other parts of the basin.

- Climate Change: Climate change could increase the potential for overdraft by increasing demand, reducing other sources of supply, and reducing natural recharge and inflows from surface water and precipitation.

- Regional Growth: Population growth could increase demands on groundwater supplies, potentially creating risk of overdraft. Regional growth could also increase the amount of contaminants entering groundwater basins, either as a result of increased urban runoff or industrial or other activities that could increase which support regional growth. Growth can also impact recharge areas by expanding impervious surfaces into areas that would otherwise represent entry points for surface water recharging local aquifers.

- Water Quality: Groundwater quality can be negatively impacted as groundwater pumping creases, recycled water use expands without appropriate management measures in place, and as a result of urbanization, land use, and industrial activities. Some water quality issues are naturally occurring, while others are a result of human actions. Decreased quality of groundwater poses threats to supplies that require additional costs to treat, or otherwise make the use of groundwater impractical in the light of other sources.

Imported Water Supply

The majority of Western's supply is purchased from Metropolitan Water District of Southern California (Metropolitan), which relies on imported water from the State Water Project (SWP) and the Colorado River Aqueduct. Both of these imported supplies are identified in the IRWM Climate Change Vulnerability Checklist as particularly climate-sensitive regions. Climate change is anticipated to cause significant changes to temperature, sea level, and precipitation patterns throughout California. The combination of these factors could lead to increased sea water intrusion in coastal aquifers and estuaries, decreased snowpack in the Sierra Nevada, coupled with earlier melting, leading to decreased water from snowmelt available in summer months, and an increase in the intensity of storm events. Each of these factors presents a unique set of challenges for water supply managers and necessitates careful planning to ensure sustainable water supplies into the future.

Increasing concerns exist about the reliability of imported water, particularly from the Bay-Delta, driven by climate change, competing demands and environmental goals. As part of the 2015 updates to its UWMP and Integrated Water Resources Plan (IRP), Metropolitan evaluated the reliability of these supplies and concluded that if nothing is done to invest in water supplies or conservation, supply short-falls are likely to occur in the future.

Potential constraints to Metropolitan supplies, and thus to 70% of Western's retail demands, and associated supply reliability include:

- Drought: The Colorado River has been in drought conditions for much of the past 15 years, exacerbating claims to water in the River. The Sacramento-San Joaquin Delta (Bay-Delta) has suffered reduced flows and rising temperatures in the current drought, and SWP supplies have been significantly curtailed during the current drought.
- Environmental/Ecological Needs (Operational Constraints): Sensitive species in the Bay-Delta system require base flows for survival; these flows are threatened by drought and other factors, reducing the volume of water available for pumping to the SWP. As species become further stressed, environmental demands on Bay-Delta water may increase.
- Climate Change: Climate change is anticipated to increase the frequency and intensity of droughts and flooding, alter the timing of snowmelt, and increase variability in precipitation while raising average temperatures. These effects may reduce the availability of supplies in the Bay-Delta and Colorado River systems, as well as change the timing of availability, which could reduce Metropolitan's ability to utilize the supplies that it can access, all while demands are anticipated to increase as a result of climate change. Sea level rise poses a significant challenge to the salt balance in the Bay-Delta with likely impacts to the supply balance that can be expected. Sea level rise also increases the vulnerability of the Bay-Delta supply to seismic events.
- Threats to Infrastructure: Metropolitan's imported supplies must travel across large distances to reach turnouts where local agencies are able to access the water. California is a seismically active state, prone to wildfires, which could damage imported water infrastructure anywhere along the SWP or Colorado River Aqueduct in such a manner as to disrupt supply availability. California is also a large state with a large economy, housing some major industries and defense installations. This makes it a potential target for acts of terrorism, including potential threats to its water supplies and infrastructure.

Project

The proposed project directly addresses a heightened competition for finite water supplies and over-allocation (e.g., population growth) by using smarter technology and more advanced infrastructure to better manage the water supply.

Describe how the project will address the water reliability concern? In your response, please address where the conserved water will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.

By installing AMI and a customer portal, Western will be able to reduce water demands by approximately 1,400 AFY. Approximately 70% of this water is imported water from Metropolitan Water District and the State Water Project. 30% of this water comes from local water supplies.

The 1,400 AFY of conserved water will essentially remain at its source, in the Bay-Delta, to help maintain instream flows and improve ecosystem health.

There are several project benefits that relate to water supply concerns:
By getting AMI hourly reads, Western is able to better understand customer patterns and their water needs. This provides Western with knowledge and information to set baselines and understand who could be impacted in water supply reductions, increasing water supply resiliency.

With hourly reads, Western can better enforce Drought Contingency Plans and enforcement actions in times of drought.

Statewide Conservation Targets have been developed from the latest drought and the growing concern over climate change. Accurate readings and decreasing water loss can provide Western with more accurate numbers for Gallons per Capita Daily (GPCD) and can help Western set new targets and meet current and future statewide conservation goals, increasing Western customer's resiliency to climate change.

The project also directly contributes to reducing irrecoverable water losses. The AMI technology will reduce water inefficiencies of the targeted customers by facilitating leak identification, highly improved metering accuracy and improved customer awareness. Western has an operational policy to use local supplies first and supplement with imported water. By not losing approximately 1,400 AFY of water supply, Western is able to utilize more water from local supplies. It is the goal of Western to be able to provide local water supplies for each customer's water budget (Water budget is Tiers 1 and 2). Imported water would be used for customer's going over their water budget. By conserving water and losing less water from leakages, Western is getting closer to meeting its goal and decreasing concerns over water reliability.

As a result of Phase 2, Western will be able to put water supplies to better use, increasing water reliability for its customers.

Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.

There is no mechanism to put conserved water to its intended use. Less water lost means less water taken. The water conserved increases water reliability, because less water will be diverted from the

Delta and Colorado River, increasing the health of the Delta and Colorado River, decreasing water restrictions due to habitat health and shortage supply.

Indicate the quantity of conserved water that will be used for the intended purpose.

By installing AMI and a customer portal, Western will be able to reduce water demands by approximately 1,400 AFY and this water will stay at its sources, the Delta and Colorado River.

1.5.2.2 Multiple Benefits

Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?

Yes, there are multiple sectors that benefit from the proposed Phase 2 project. See response below in the section "Describe how the project will help to achieve these multiple benefits."

Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.

Conserving 1,400 AFY of water will decrease the amount of water Western purchases from the State Water Project, reducing the demands on the Delta.

Reducing imported water from the State Water Project is a direct benefit to the Delta Smelt and other species, such as the Shad and Striped Bass. Reducing the amount of water Western takes from the Delta allows water to stay in this vital ecosystem, where many of the aquatic species are endangered or threatened.

For example, the Project will benefit the endangered Delta Smelt, which is endemic to the upper Sacramento-San Joaquin Estuary and mainly inhabit the freshwater-saltwater mixing zone. With more freshwater being diverted to the State Water Project, the mixing zone becomes more brackish and further endangers the Delta Smelt, which causes a ripple effect on the ecosystem. Since the implementation of this project will reduce the amount of water exported from Northern California stream systems, there will be a positive benefit for the sensitive species in the Sacramento–San Joaquin River Delta including the Delta Smelt (federally endangered) and its critical habitat, and the Longfin Smelt. With the 2017 wet year, the American Shad and the Striped Bass population increased, where the previous dry years had a negative impact on population. It is no question that extra fresh water in the Delta had a positive impact on the fish populations. Thus, the less water taken from the Delta

during the wet and dry years is beneficial to the habitat and the species that inhabit the Delta. In summary, this project does benefit species.

Will the project benefit a larger initiative to address water reliability?

Yes, the Phase 2 project is under larger initiatives to address water reliability through the Water Loss Task Force and the Water Use Efficiency Master Planning Efforts. On page 58 of the Water Use Efficiency Master Plan (see attachment), the plan states, "Western is in the process of implementing advanced metering infrastructure (AMI) systems that will meticulously track water usage and provide both Western and the customer with meaningful data. By providing key trends in water usage, AMI systems can drive water efficiency and influence change by providing customers with data to manage their use. With periodic readings per day, as opposed to a few per year, AMI systems help provide a reliable baseline for comparison purposes. This data can be used to alert Western and/or the customer about anomalies in water use and trigger early response to leaks or other sudden increases in use." There are no formal reports from the Water Loss Task Force planning efforts, but AMI is a strategy that was proposed and is being followed through in Western's Capital Improvement Plan.

In addition, the proposed project complies with Senate Bill 555 on water loss management. Senate Bill 555 requires the state to achieve a 20% reduction in urban capital water use by December 31, 2020 and require validated water loss reports. SB 555 references water loss techniques established in the AWWA's M36[7] manual. This manual describes the importance of having access to hourly meter reads to control water loss. This can be accomplished through Western's proposed AMI system. In addition, the M36 manual also specifies customer engagement as a tool for water savings. This can be accomplished through Western's proposed Customer Portal. Meter replacement will help increase the score on Western's yearly validated water audit. Senate Bill 606 and Assembly Bill 1668 collectively focusing on "Making Conservation a Way of Life" that details metering as a suggested demand management method. Further, the proposed project is envisioned in Western's UWMP. Western's meter testing and replacement program is described in its 2015 UWMP and the proposed project is a targeted improvement on the meter replacement program.

[7]AWWA. 2009. Water Audits and Loss Control Programs: Manual of Water Supply Practices M36. Third Edition.

Will the project benefit Indian tribes?

No, there are no Indian tribes in Western's retail service area. The project will involve meter upgrades or replacements of existing meters which would not result in adverse impacts on tribal lands.

Will the project benefit rural or economically disadvantaged communities?

The project will not have a disproportionately high or adverse effect on low income or minority populations. In fact, the project may provide financial benefits to customers receiving meter upgrades

through timely leak detection and water conservation which could reduce water bills. Although not quantified at this point, 1,400AFY reduction in imported water will decrease the cost of water and increase the proportion of local water to imported water. Since Western's rates are based on the cost of water, a higher proportion of less expensive local supply will help drive down the unit cost of water, decreasing the cost of water in the rates, thus potentially decreasing water bills. In addition, less water used by customers will immediately mean lower bills for those customers.

Describe how the project will help to achieve these multiple benefits. In your response, please address where the conserved will go and where it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.

Rate Payers: When water deliveries are unrecorded in Western's system, all of Western's customers are paying for this water in the commodity rate calculation. When it's a leak, no one is using the water. When it's an under-reading meter (due to age), then the person using the water is not paying their share of the water. The burden of these costs is distributed to all of Western's customers. By using AMI technology and infrastructure, Western can easily find and target leaks and underperforming meters and stop the water loss, therefore, creating greater equity among customers. With AMI, they will only pay for what they use.

Environmental: The conserved water would essentially remain at its source, in the Bay-Delta, to help maintain instream flows and improve ecosystem health. Improved stream flows also contribute to improving water quality conditions in the Bay-Delta by reducing concentrations of pollutants and helping to maintain optimal water temperatures. Reducing imported water from the State Water Project is a direct benefit to the Delta Smelt and other species, such as the Shad and Striped Bass. Reducing the amount of water Western takes from the Delta allows water to stay in this vital ecosystem, where many of the aquatic species are endangered or threatened.

Energy: Due to the water-energy nexus, reduced demands resulting from the project will also result in reduced energy requirements and related emissions associated with source production, conveyance, and treatment requirements. Assuming the project will result in 1400 AFY less water diverted from the Delta and transported via the SWP to Western's distribution system, the project would result in annual energy savings of approximately 4,530,400 kWh. This is based on an estimate that the SWP East Branch has a water energy intensity of 3,236 kWh/AF.

Water Reliability: Most importantly, by increasing efficient use of available water supplies, the proposed project will contribute to improved water supply reliability, by making saved water available to meet other demands.

Statewide: State-wide benefits resulting from the proposed project include benefits to the Delta and reductions in energy use as well as reductions in greenhouse gas emissions resulting from reduced demands, as described above. By improving local water supply reliability through increased water use efficiency and by reducing demands on Bay-Delta water supplies, the project also has the potential to free up supplies for use by other water purveyors within the State.

The proposed project shall achieve the goal of measuring water savings and thereby, reduce water waste. The new meters will lessen the demand for water through their ability set customer alerts and identify leaks. The widespread use translates to a reduction in the amount of imported water demanded by the City, leaving more water available in the State Water Project and Colorado River water system and therefore, ensuring reliability of water year-round.

As drought conditions continue to challenge the region, AMI technology will provide new tools that empower customers to make better decisions, about their water use. AMI is proving to be an effective solution around the world for educating consumers about their water consumption and the impact such conservation would have in reducing expenses. This enhanced meter has the potential to yield reductions in water use and increased conservation awareness by all customer groups served and ultimately, contribute to the achievement of sustainable solutions to water supply reliability. As a result of the project implementation, water saved will reduced water importation and shall support ecosystem restoration and water quality.

1.5.3.2 Collaboration

Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?

Western is the retail water purveyor for the Riverside and Murrieta service areas and is authorized to implement the proposed project within those areas. Western will notify customers of the proposed improvements to their meters in order to inform them on the project purpose and overall implementation plan. However, as part of the Santa Ana Watershed, AMI is a practice highly supported by the Santa Ana Watershed Project Authority and the member agencies. In addition, Western is surrounded by agencies it wholesales to, such as Rancho California Water District (RCSD) and Elsinore Valley Municipal Water District (EVMWD), both of whom have AMI systems and customer portals in place. With the proposed project, Western's customers will now have similar services as their neighbors. This will help spread the message about water conservation and available rebate programs. It will even allow flexibility in conservation messaging and coordinated efforts among the local agencies.

Is there widespread support for the project?

Yes, there is widespread support for this project. Water savings, improved leak detection and reduced metering inaccuracies can all result in lower water bills. Therefore, it is anticipated that customers will support and cooperate with this project.

Western has also submitted Western's plan—to make its retail customer base have AMI meters—to the Santa Ana Watershed Project Authority's (SAWPA) One Water One Watershed (OWO) 2.0 Plan, which also serves as the Integrated Regional Water Management (IRWM) Plan. Western's surrounding agencies are highly supportive of AMI infrastructure and integration.

See also 2 attached letters of support for this project from SAWPA and RCWD.

What is the significance of the collaboration/support?

Western met with Rancho California Water District (a local retail agency) to learn about their experiences implementing AMI and used their insight to develop their AMI outreach plan. In addition, many of the nearby water agencies already have AMI meters in their service areas. These agencies speak highly of AMI and their support of AMI lends to great support for Western staff when speaking with their customers. For Riverside County, the neighboring water districts can separate cities. For example, two next-door neighbors can have two different water districts. This occurs frequently for Western and RCWD and EVMWD. Collaboration between agencies is important because it helps bring the same level of service to communities, no matter what side of the road you live on.

See also 2 attached letters of support for this project from SAWPA and RCWD.

Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?

With the use of a customer portal, Western can send messages related to rebate programs and other water conservation programs directly to the customer. Western can also use AMI data to better track water savings related to water conservation programs. With AMI data and this project's focus on water loss, Western will be able to improve its GPCD estimates and targets for statewide conservation efforts.

In addition, Western can collaborate on message content and timing of the messages with agencies in Western's Service Area that already have AMI and customer portals. Western has already been in discussions with a local university, University of California, Riverside, to develop a study around the effectiveness of the conservation campaigns. With AMI and the customer portal, we can include the neighboring agencies in our service area and limit biases that could occur from different message systems.

Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?

The Project will not directly fulfill Reclamation's legal or contractual obligations. However, Western is a member of three Watermasters in Southern California. Although not directly preventing a water-related crisis or conflict, Western is showing the other agencies involved in these legal agreements that Western is doing everything it can to be proactive in understanding its water use, getting customers to conserve, and minimizing water loss, thus enhancing local water supply reliability.

Although 2019 was a great year for water in California, climate change points to less snowpack and more statewide droughts becoming the norm. A reoccurrence of 2015 water supply, where Sierra Nevada Mountain snowpack was at 5% of average and the State Water Project Allocation was also at 5%, is likely to occur again. Showing the Delta stakeholders that Southern Californian agencies are doing as much as they can to take less imported water and not waste water will help alleviate tensions over California's water supply. In addition, over 1,400 AF of water will be saved from the Bay-Area Delta, a reclamation project, and the water will be kept at its source, helping to alleviate tensions over that water source.

Describe the roles of any partners in the process. Please attach any relevant supporting documents.

No partnerships are necessary for successful implementation of the project, however cooperation from Western's targeted customers is important. Water savings, improved leak detection and reduced metering inaccuracies can all result in lower water bills. Therefore, it is anticipated that customers will support and cooperate with this project.

Further, the roles of partners such as wholesalers and neighboring utilities in the process of implementing the AMI project will be a collaborative and financially supportive relationship. This is in part due to the possibility of sharing communication infrastructure to enhance the reach of the AMI and provide for a steady and accurate stream of meter data to our cloud service.

See also 2 attached letters of support for this project from SAWPA and RCWD.

1.5.4.2 Addressing Water Supply Reliability

Will the project address water supply reliability in other ways not described above?

The proposed Phase 2 project will reduce water waste by increasing water conservation and decreasing water loss. 1400 AFY of water is estimated to be saved, reducing the amount of imported water supply. This will help the region increase reliability of water year-round. As drought conditions continue to challenge the region, AMI technology will provide new tools that empower customers to make better decisions, about their water use. AMI is proving to be an effective solution around the world for

educating consumers about their water consumption and the impact such conservation would have in reducing expenses. This enhanced meter has the potential to yield reductions in water use and increased conservation awareness by all customer groups served and ultimately, contribute to the achievement of sustainable solutions to water supply reliability. As a result of the project implementation, water saved will reduced water importation and shall support ecosystem restoration and water quality.

1.5.3 Evaluation Criteria C: Implementing Hydropower

This project does not include construction or installation of a hydropower system, but the proposed project does save a substantial amount of electricity through decreasing the amount of imported water consumed. The imported State Water Project water has a high energy load related to the pumping, distribution, and treatment of the water.

Due to the water-energy nexus, reduced demands resulting from the project will also result in reduced energy requirements and related emissions associated with source production, conveyance, and treatment requirements. Assuming the project will result in 1400 AFY less water diverted from the Delta and transported via the SWP to Western's distribution system, the project would result in annual energy savings towards water distribution of approximately 4,530,400 kWh/yr. This is based on an estimate that the SWP East Branch has a water energy intensity of 3,236 kWh/AF. This is equivalent to removing 3,204 metric tons of greenhouse gas emissions a year. According to the EPA greenhouse gas equivalency calculator, the 4.5 million kWh/yr of energy savings is the same amount as providing electricity to 559 homes for one year or the same as running 67% of a wind turbine for a year.

Although the project does not implement hydropower, it does reduce energy demands for California by 67,956,000 kWh over the 15-year lifetime of the project, providing more energy resources for other projects.

1.5.4 Evaluation Criteria D: Complementing On-Farm Irrigation Improvements

This project is not a compliment to ongoing or future on-farm improvements. However, Western does have customers with farms and nurseries. The AMI project could help these farms reduce the amount of water they consume by leak notification, seasonal customer information and reports, overall education for the customer on their usage and trends.

1.5.5 Evaluation Criteria E: Department of Interior Priorities

Creating a conservation stewardship legacy second only to Teddy Roosevelt

- Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;

The unpredictable water supply and ever-increasing demand on California's complex water resources has resulted in a coordinated effort by the DWR, water utilities, environmental organizations, and other interested groups to develop a list of urban BMPs, also known as demand management measures

(DMMs), for conserving water. This consensus-building effort resulted in Senate Bill No 555 requiring the state to achieve a 20% reduction in urban per capita water use in California by December 31, 2020 and actively engage in water loss activities. AMI has been identified as a best practice towards the management of water resources.

Restoring trust with local communities

- Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;

The District intends to promote its mission statement: "Western Municipal Water District provides water supply, wastewater disposal and water resource management to the public in a safe, reliable, environmentally sensitive and financially responsible manner." This will be done by engaging the local community, answering any questions or concerns the community may have, and showing them that we are working hard to better the environment through this Project and further help conserve one of our most precious natural resources, water.

Modernizing our infrastructure

By installing the various AMI infrastructure such as the antennas in Murrieta Service Area, we could offer support for private sector efforts to utilize our modernized infrastructure to enhance their own projects and serve the public in a more efficient and cost-effective manner.

We will be prioritizing the DOI infrastructure needs to highlight;
Construction of infrastructure – Constructing antennas that will receive the various AMI smart meter data and relay water leak alerts at their source and time of occurrence. This will allow the District to fix the leak much sooner than the conventional method thus resulting in decreased water losses.

Cyclical maintenance – The AMI project will offer opportunities for smart maintenance based on big data and analytics. The District will be able to identify faulty or incompetent water meters much sooner resulting in increased water savings.

1.5.6 Evaluation Criteria F: Implementation and Results

1.5.6.1 Project Planning

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place?

Recognizing persistent yet less severe drought conditions throughout California, on May 18, 2016, the State Water Board adopted a revised water conservation regulation that replaces the emergency conservation regulation. The new regulation in effect from June 2016 through January 2017 required locally developed conservation standards based upon each agency's specific circumstances.

The District recognizes the importance of continued water conservation and is committed to implementing water conservation measures for all customer sectors with a goal of achieving a 20 percent water use reduction by 2020. The previous system, which established water use allocations for individual customers and assessed water conservation surcharges for overuse, was replaced in favor of increased customer outreach, rebates, public education and AMI implementation for District customers.

The District does have a water conserving plan. See information below.

Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.

The District maintains numerous planning documents addressing water shortages and conservation alternatives including:

- 2015 Urban Water Management Plan (UWMP) (attached)
    - Preparation of an Urban Water Management Plan (UWMP) is required by the California Department of Water Resources (DWR) for all urban water suppliers within the State of California. This plan is a resource document that includes an analysis of long-term water supply and demand planning for Western's wholesale and retail service areas.
- SAWPA OWOW Integrated Regional Water Management Plan (IRWM) (attached)
    - Revised in 2018, the Plan reflects a collaborative planning process that addresses all aspects of water resources in the Santa Ana River Watershed. It includes planning of future water demands and supplies over a 20-year time horizon within the watershed as a hydrologic and interconnected system.
- Western Water Conservation Ordinances
    - A presentation detailing Water Shortage Stage 4B is attached.
- Western Water Use Efficiency Master Plan (attached)
    - Approved in 2019, the Master Plan details goals for the district in their water efficiency planning such as creating resilient and drought-proof customers.

Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).

- 2015 Urban Water Management Plan (UWMP)
    - The Project is in alignment with the District's latest UWMP that focuses on BMPs for metering in association with water conservation and water management. The CUWCC MOU regarding Conservation in California section in the UWMP references CUWCC's best practices which references metering and AWWA's M36 Manual (page 131).
- SAWPA OWOW Integrated Regional Water Management Plan (IRWM)

    - The Project is in alignment with the region's objective to increase local reliability and identifies "Water Use Efficiency" Programs as high priority projects for the Region. One OWOW goal is to improve data integration, tracking, and reporting that strengthens decision making. The General Manager of SAWPA supports this proposed project as meeting the goals of the OWOW Plan. (See support letter attached).
- Western Water Conservation Ordinances
    - The Project is in alignment with current water conservation ordinances designed to encourage and promote water conservation. For example, outdoor watering under Water Shortage 4B states that outdoor watering is to occur between 8 pm and 8 am. With monthly reads, this was difficult to enforce. AMI is a technology that allows this enforcement to be monitored in future drought stages.
- Western Water Use Efficiency Master Plan
    - The Project is in alignment with the details of the Water Use Efficiency Master Planning effort. (Page 58)
    - Customer Portals and putting data in the hands of the customers is a large component of this planning effort (Page 59).

1.5.6.2 Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved).

Western realizes the importance of quantifying results to evaluate the Project's performance. Evaluating AMI Project metrics is an important means of determining the relative effectiveness of this water conserving strategy.

It is the goal of the Western to fully evaluate the benefits and capabilities of the AMI technology by establishing a set of key performance measures to quantify the Project benefits. These performance measures are preliminary and will be further evaluated and refined throughout the planning and implementation stages of the Project.

Western will use the following performance measures to evaluate the performance of the newly installed AMI equipment:

- Water Conserved
    - Due to existing growth and construction in the Project area, accurately gauging the effectiveness of the AMI implementation will require analysis of individual accounts in the Project area to quantify reduction in water demand and determine AMI effectiveness. Historical consumption data prior to AMI implementation will be compared with

consumption data after AMI implementation. Favorable changes in observed water demand patterns will quantify the overall success of the AMI implementation.

- Water conserved includes water losses mitigated. The District will perform water loss audits using American Water Works Association methodology and review water usage reports for the AMI implementation service area to ascertain the reduction in water losses and unaccounted-for water that has been recuperated.

In addition, data analytics and customer engagement portal software is included as part of the Project proposal and will assist Western in analyzing the data collected from the Project. It is the goal of the Western to equip employees with the necessary tools to not only monitor water production and consumption but to also analyze and evaluate solutions for minimizing water losses and increasing water use efficiency. Similarly, it is the goal of Western to provide tools and resources to the customers so that they can comprehensively understand their water usage patterns and have access to regular feedback on the effectiveness of any activities and efforts to reduce water usage in their homes and businesses.

1.5.6.3 Readiness to Proceed

Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

The detailed scope of work can be found in the Project Description portion of the application.

After the start of the fiscal year, Western will prepare open bid documents to find a contractor for the installation of the AMI meters, installation of the antennas for the Murrieta Service Area, and Project Management Services. The actual installation of the projects will begin at the start of 2020 and will take over two years to complete. During this time, Western will be developing the Customer Portal and outreach materials to educate customers on their new portal. Estimated Start Date is 9/1/2019. Estimated End date is 6/30/2022. The project is anticipated to be completed in under 3 years.

Table 1.1 Phase 2: Riverside Service Area Meter Replacement and Customer Portal

	Task	Begin Date	End Date
1	Environmental Documentation/ Permitting	Not Applicable	
2	Cost and Feasibility Studies	Complete	
3	Contracting – Phase 2	9/1/2019	12/31/2019
4	Phase 2 Construction and Project Management	1/1/2020	02/28/2022
5	Customer Portal	1/1/2020	6/30/2022
6	Outreach	1/1/2020	6/30/2022

Describe any permits that will be required, along with the process for obtaining such permits.

No permits or special approvals will be needed for implementation of the proposed project. Project work will be conducted at existing meter locations that are fully within Western's authority.

Identify and describe any engineering or design work performed specifically in support of the proposed project.

Design work is complete. Design work for the proposed project included meter accuracy testing, technology alternatives review, and development of a water service meter strategic plan. The strategic plan provides an effective guide to replace existing meters and forms the basis for the proposed project.

Describe any new policies or administrative actions required to implement the project.

There are no new policies or administrative actions required to implement the project.

Describe how the environmental compliance estimate was developed. Has the compliance cost been discussed with the local Reclamation office?

The proposed project will not involve ground-disturbing work and would be categorically exempt from CEQA and categorically excluded from NEPA. Therefore, no environmental compliance analysis costs are included in the proposed budget.

1.5.7 Evaluation Criteria G: Nexus to Reclamation Project Activities

Is the proposed project connected to Reclamation project activities? If so, how?

Reclamation's WaterSMART Program focuses in part on the uses of technology to balance future water supply and demand needs throughout California and the western United States. The proposed Project demonstrates the opportunities for significant water and energy conservation through remote sensing, state-of-the-art software, and systems integration. Water conserved is directly related to the CALFED Bay-Delta Program which is a major ongoing Reclamation activity.

Western is a member agency of the Santa Ana Watershed Project Authority (SAWPA) "One Water One Watershed (OWOW)" program. OWOW is SAWPA's Integrated Water Resources Management Plan. SAWPA Governance and the participants in OWOW provide a collaborative, transparent, and watershed-wide view embraced by the OWOW planning process from the onset seeking to improve the way in which water and other environmental resources are managed in the watershed. The Santa Ana Watershed Basin Study, a Reclamation project, helped SAWPA and its member agencies identify data gaps, conduct tradeoff analyses, address the effects of climate change, and develop effective adaptation strategies. Through this study, SAWPA and Reclamation have provided leadership on the path to a secure and sustainable water future, because without action, the demand for more water will quickly

outstrip the amount available to the watershed's populations, agriculture, and industries. The Basin study's purpose is to effectively manage the Santa Ana River basin's finite water resources to meet future needs.

The study has multiple Santa Ana River Watershed (SARW) Adaption Activities.

Reduce Demand: the purpose is to conform to the State's 20x2020 water conservation plan. Western's AMI project will reduce the amount of water we will need to purchase from SWP an estimated 1,400 AFY. Last year Western purchased 12,000 AF of SWP through the Mills Treatment Plant. With the implementation of AMI project, the 11% reduction is SWP needed, greatly helping Western meet the State's 20x2020 requirement.

Resource Stewardship: the purpose is to improve management of watershed lands, wildlife, and water resources through conservation, preservation, and ecosystem restoration. Western's AMI project conserves 1400 AFY that will not be purchased from SWP for drinking water purposes, thus not diverting the water from it source in the Delta, thus helping keep more freshwater in the Delta increasing the health of the ecosystem.

AB 32 Compliance: the purpose is to develop methodology for quantifying energy intensity of SARW water supplies and uses and to perform carbon footprint assessment and use the GHG Calculator Tool to identify additional opportunities for reducing carbon emissions. Due to the water-energy nexus, reduced demands resulting from the project will also result in reduced energy requirements and related emissions associated with source production, conveyance, and treatment requirements. Assuming the project will result in 1400 AFY less water diverted from the Delta and transported via the SWP to Western's distribution system, the project would result in annual energy savings towards water distribution of approximately 4,530,400 kWh/yr. This is based on an estimate that the SWP East Branch has a water energy intensity of 3,236 kWh/AF. This is equivalent to removing 3,204 metric tons of greenhouse gas emissions a year. According to the EPA greenhouse gas equivalency calculator, the 4.5 million kWh/yr of energy savings is the same amount as providing electricity to 559 homes for one year or the same as running 67% of a wind turbine for a year. Although the project does not implement hydropower, it does reduce energy demands for California by 67,956,000 kWh over the 15-year lifetime of the project, providing more energy resources for other projects.

Does the applicant receive Reclamation project water?

Approximately 70% of Western's water is imported from the State Water Project, which is sourced from the Bay-Delta. The proposed AMI project will have considerable reduction of water usage due to the real time data, alerts of customer water leaks, educational reports for District use as well as

customer use, and identifying water loss throughout the distribution system. This will lead to a reduction in water diverted for SPW; which directly related to the CALFED Bay-Delta Program.

Is the project on Reclamation project lands or involving Reclamation facilities?

The Project focuses on Western's water delivery and distribution and does not directly involve Reclamation project lands or facilities.

Is the project in the same basin as a Reclamation project or activity?

Yes. The proposed project will reduce reliance on imported water and benefit the Bay-Delta where Reclamation has carried out operations and projects.

The proposed AMI project is located in the Santa Ana Watershed Basin. The Bureau of Reclamation has many projects located in the Santa Ana Watershed Basin. Bureau of Reclamation and Santa Ana Watershed Project Authority Complete Santa Ana Watershed Basin Study was completed in 2013. The basin study analyzed the future water supply and demand scenarios based on factors such as projected changes in climate, and varying levels of growth for municipal, agricultural and business interests in the Santa Ana River Watershed. The report found this watershed has challenges due to climate change and growing populations. The challenges in this Santa Ana watershed include increasing demand, earlier snowmelt and runoff, faster than historical sea level rise threatening coastal communities, and improvement of water infrastructure and groundwater basins. Western is a member of SAWPA's OWOW program.

Will the proposed work contribute water to a basin where a Reclamation project is located?

The project will conserve 1,400 AFY of water, where about 70% of this water will not be taken from the Bay-Delta. From the lifetime of the project, approximately 21,000 AF will be saved from the State Water Project.

Will the project benefit any tribe(s)?

No, there are no Indian tribes in Western's retail service area.

1.5.8 Evaluation Criteria H: Additional Non-Federal Funding

$$\frac{\textbf{Non-Federal Funding: } \$2{,}690{,}717}{\textbf{Total Project Cost: } \$3{,}690{,}717} = \mathbf{72.9\%}$$

Section 2: Project Budget

2.1 Funding Plan

Monetary contributions will come from Western funds, including proceeds from the 2016 Headquarters Building refinancing, Conservation Penalty Revenue, and from operating reserves of the Riverside Potable Water Operating Fund and Riverside Nonpotable Water Operating Fund. In addition, $750,000 of grant funds was approved for Phase 1. In the Capital Improvement Process, staff recommended that funding previously set aside for Phase 1 be reallocated to Phase 2.

No funding will be provided by a third party and therefore no letters of commitment for this project. No funding has been requested or received from other Federal partners for the proposed Phase 2 project. There are no other outstanding funding requests for the proposed project.

Table 2.1 below summarizes all funding sources (non-Federal and Federal) for the proposed project.

Table 2.1. – Total Project Cost Table

Source	% of Project Cost	Amount
Costs to be reimbursed with the Requested Federal Funding	27.1%	$1,000,000
Costs to be Paid by the Applicant	72.9%	$2,690,717
Value of Third Party Contributions	0%	$0
	TOTAL PROJECT COST	**$3,690,717**

2.2 Budget Proposal

The Project Budget consists of costs associated with the implementation of the proposed project and fall within various budget categories, including supplies and materials, contractual/construction, among others. The budget proposal is provided in Table 2.2, which reflects all budget categories listed in the FOA. The budget items included in the table are described in detail below.

Table 2.2 – Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	$/Unit	Quantity		
Salaries and Wages				
Not Applicable				$0
Fringe Benefits				
Not Applicable				$0
Travel				
Not Applicable				$0
Equipment				
3/4" Neptune T10 W/R900i meter	$306.38	5,770	Each	$1,767,813
1" Neptune T10 W/R900i meter	$370.88	1,238	Each	$459,149
Meter lid replacement	$51.00	7,008	Each	$357,408
Antenna/Connectors	$20,000	5	Each	$100,000
Supplies and Materials				
Outreach Materials for Meter Replacement	Western Staff Estimate for Printing Costs			$2,000
Outreach Materials for Portal	Western Staff Estimate for Printing Costs			$5,000
Contractual/Construction				
Installation/Box Cleaning	Phase 1 Estimates from Golden Meters Service			$479,347
Construction Management	Phase 1 Bid from MC Engineering			$125,000
Portal Set-Up	DropCountr			$20,000
Portal Subscription Fee	DropCountr ($35,000/yr) – 10 years			$350,000
Portal Roll-out	Consultant to do media and marketing materials			$25,000
Third-Party Contributions				
Not Applicable				$0
Other				
Not Applicable				$0
TOTAL DIRECT COSTS				**$3,690,717**
Indirect Costs				
Not Applicable				$0
TOTAL ESTIMATED PROJECT COSTS				**$3,690,717**

2.3 Budget Narrative

Salaries, Wages, and Fringe Benefits

The majority of project work will be conducted by specialized contractors. For this reason, Western will not be seeking reimbursement for staff time spent on the project. Fringe benefits are not included in the overall project budget.

Travel

Western staff anticipate visiting the project site periodically during project implementation, but this travel would be part of normal staff activity and no reimbursement or match for staff travel is being sought. It is not anticipated that there will be travel required by the consultant/contractor. However, if there is, those costs would be captured within the "contractual" budget category with any consultant/contractor cost estimates.

Equipment

Western requested proposals from vendors to provide the equipment needed for the Riverside Service Area Meter Replacement and Retrofit. Ferguson Waterworks was the lowest responsive vendor. Costs documented in Table 2.2 reflect the price negotiated with Ferguson Waterworks. Since the proposed project is a meter replacement, equipment to replace the meters is a required expense.

Equipment				
Budget Item Description	Quantity Cost	Quantity Count	Quantity Type	Total Cost
3/4" Neptune T10 W/R900i meter	$306.38	5,770	Each	$1,767,813
1" Neptune T10 W/R900i meter	$370.88	1,238	Each	$459,149
Meter lid replacement	$51.00	7,008	Each	$357,408
Antenna/Connectors	$20,000	5	Each	$100,000

Materials and Supplies

Western staff have budgeted $7,000 in outreach materials. This will cover the printing of materials such as brochures and door hangars (the latter will be placed prior to installation activities), as well as the costs to print information about the new Customer Portal. The costs are based on actual costs from Phase 1.

Contractual/Construction

Contractual/Construction work to be performed by a contractor is described in Section 1.4.2 of this application.

For Phase 1, a contractor, Golden Meters Service (GMS), performed the installation and retrofit of all meters associated with this project. The bid proposal submitted by GMS for the meter installation and retrofit work was in the amount of $52.00 per meter and $8 to install the lid. This bid was the lowest responsive and responsible bid to complete the project. In addition to the bid amount, Western staff identified the potential for additional meter box cleaning depending on meter box conditions during installation, and for more meter box lid replacements than was originally anticipated due to the implementation of the LoRa-based meter read transmission technology. These additional services cost $28.00 per meter.

For Phase 2, Western will need to go through the public works bid process. The Implementation Plan for this Task has start date of 9/1/2019. Until the bid process and subsequent award of contract, these grant costs are estimates and may change. However, Western staff are confident that the costs will not change by much and, if anything, are more likely to increase as the quotes are over 3 years old.

For Phase 1, MC Engineering had provided Western with analysis and design support in relation to this project. Phase 2 will hire a contractor to provide project management services. Phase 2 Project Management Services will go through a Request for Proposal (RFP) process. The Implementation Plan for this Task has a start date of 9/1/2019. Until the proposal process and subsequent award of contract, these grant costs are estimates and may change. Related cost estimates during the construction phase are based on a proposal provided by MC Engineering for Phase 1. However, Western staff are confident that the costs will not change by much.

For the Customer Portal, Dropcountr provided Western with a price proposal. Their pricing model includes a $20,000 one-time fee and a $35,000 annual subscription. The subscription fee paid for 10 years is included in the project budget.

Lastly, Western will hire a consultant to develop marketing and educational materials for the new Customer Portal. An RFP for this portion of the project has not been released and that process is not expected to begin until 1/1/2020. Western Staff estimated the project would cost $25,000 with their estimate based on costs completed for similar work.

Contractual/Construction		
Budget Item Description	Comment	Total Cost
Installation/Box Cleaning	Phase 1 Estimates from Golden Meters Service	$479,347
Construction Management	Phase 1 Bid from MC Engineering	$125,000
Portal Set-Up	DropCountr	$20,000
Portal Subscription Fee	DropCountr ($35,000/yr) – 10 years	$350,000
Portal Roll-out	Consultant to do media and marketing materials	$25,000

Overall, Western staff have no concerns that there will be large changes to the budget and believes that if awarded, any changes will not result in the project costs paid by Western becoming less than 50%.

Third-Party In-Kind Contributions

No third-party in-kind contributions are included in the proposed budget.

Environmental and Regulator Compliance Costs

As described previously, the proposed project is anticipated to be exempt from CEQA and categorically excluded from NEPA and will therefore require minimal effort for filing applicable documentation. Western will not be seeking reimbursement for staff time related to this effort. Therefore, no budget is included for this category.

Other Expenses

No other expenses are included in the proposed budget.

Indirect Costs

No indirect costs are included in the proposed budget

Total Costs

The total cost of the proposed project is $3,690,717. Funding sources for the project currently include funding from Western and requested funding from Reclamation. Western is requesting $1,000,000 in funding from Reclamation to fund the proposed project. This represents 27% of the total project costs. No other Federal funding has been requested or received for the proposed project.

Section 3: Environmental and Cultural Compliance

The proposed project will consist of replacing existing water service meters, which will not result in ground-disturbing work. As a result, the proposed project will not impact the surrounding environment. Project activities do not include ground-disturbance and will not impact sensitive species or their habitat. Further, work will be performed within already developed, urbanized and residential areas where there is limited potential for critical habitat or otherwise suitable for sensitive species. There are no “waters of the United States” located within the project boundaries and the project will not have any impacts on any nearby wetlands or surface waters. Western’s Riverside Service Area dates to the mid-1950s. The water meters targeted for replacement in Phase 2 are between 5 and 15 years old.

The proposed project will not result in any modification of or effects to individual features of an irrigation system. The project will involve upgrades to water meters and will not involve irrigation systems.

There are no buildings, structures or features within the project area that are listed or eligible for listing on the National Register for Historic Places.

There are no known archaeological sites within the proposed project area. Additionally, the proposed project will occur within already developed areas and would not affect potential archeological sites.

The project will not have a disproportionately high or adverse effect on low income or minority populations. In fact, the project may provide financial benefits to customers receiving meter upgrades through timely leak detection and water conservation which could reduce water bills.

The project will not limit access to or ceremonial use of Indian sacred sites or result in other impacts on tribal lands. The project will involve meter upgrades or replacements of existing meters which would not result in adverse impacts on tribal lands.

The proposed project is not anticipated to contribute to the introduction, continued existence, or spread of, noxious weeds or non-native invasive species. No ground disturbing work will occur as part of the project, which could contribute to spreading invasive species.

The proposed project will not involve ground-disturbing work and would be categorically exempt from CEQA and categorically excluded from NEPA. Therefore, no environmental compliance analysis costs are included in the proposed budget.

Western has determined that activities of the Riverside Service Area Meter Replacement and Retrofit do not constitute a “project” under the California Environmental Quality Act (CEQA). Based on review of Reclamation’s NEPA Handbook (February 2012), this project will qualify for a categorical exclusion under the National Environmental Policy Act (NEPA).

Section 4: Required Permits or Approvals

No permits or special approvals will be needed for implementation of the proposed project. Project work will be conducted at existing meter locations that are fully within Western’s authority.

Section 5: Official Resolutions

The attachments section of this application submission contains a draft resolution that meets the requirements of this FOA. The resolution states the identity of the official with legal authority to enter into this agreement. The resolution verifies that an appropriate official has reviewed the application submitted. The resolution states that Western has the funding specified in the funding plan. Lastly, the resolution states that Western will agree to work with Reclamation to meet established deadlines for entering into the grant agreement.

The Board of Directors of the Western Municipal Water District is scheduled to adopt a resolution which will authorize Western to apply for a WaterSMART grant, to execute a cooperative agreement with Reclamation for implementation of the proposed project and verifying Western's funding capability at its meeting on September 18, 2019. The draft resolution is provided in Appendix A. The official resolution is attached.

RESOLUTION 3097

RESOLUTION OF THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY AUTHORIZING THE DISTRICT'S APPLICATION, AND APPROVING NEGOTIATION AND EXECUTION OF A COOPERATIVE AGREEMENT WITH THE UNITED STATES BUREAU OF RECLAMATION FOR A WATERSMART: WATER AND ENERGY EFFICIENCY GRANT (FUNDING OPPORTUNITY NO. BOR-DO-20-F001)

WHEREAS, the Western Municipal Water District of Riverside County ("District") is a municipal water district established pursuant to Section 71000 et seq. of the California Water Code; and

WHEREAS, the District's imported water supply is facing a growing list of challenges associated with a prolonged drought on the Colorado River, Delta instability, climate change, aging infrastructure, and growing population; and

WHEREAS, the United States Bureau Department of the Interior, Bureau of Reclamation under the WaterSMART: Water and Energy Efficiency Grant Program will make funding available to qualifying applicants; and

WHEREAS, the Board of Directors of the Western Municipal Water District has identified a project that exemplifies the objectives of the WaterSMART Grant in its Phase 2: Riverside Service Area Meter Replacement and Customer Portal; and

WHEREAS, Western agrees to the administration and cost- sharing requirements of the WaterSMART grant criteria.

NOW, THEREFORE BE IT RESOLVED BY the Board of Directors that:

1. The District is hereby authorized to receive, if awarded, the WaterSMART: Water and Energy Efficiency Grant Program funding and will make a good faith effort to enter into a cooperative agreement with the Bureau of Reclamation for the receipt and administration of said grant funds;

2. The General Manager, Craig Miller, or his designee, is hereby authorized to take any and all action which may be necessary for the completion and execution of the project agreement and to take any and all other action which may be necessary for the receipt and administration of the grant funding in accordance with the requirements of the Bureau of Reclamation;
3. This resolution officially becomes a component part of the District's grant application previously submitted to the Bureau of Reclamation;
4. The District is capable of providing the amount of funding and/or in-kind contributions specified in the grant application funding plan;
5. This resolution shall be effective as of the date of adoption.

ADOPTED this 18th day of September, 2019.

_____
BOB STOCKTON
President

September 18, 2019

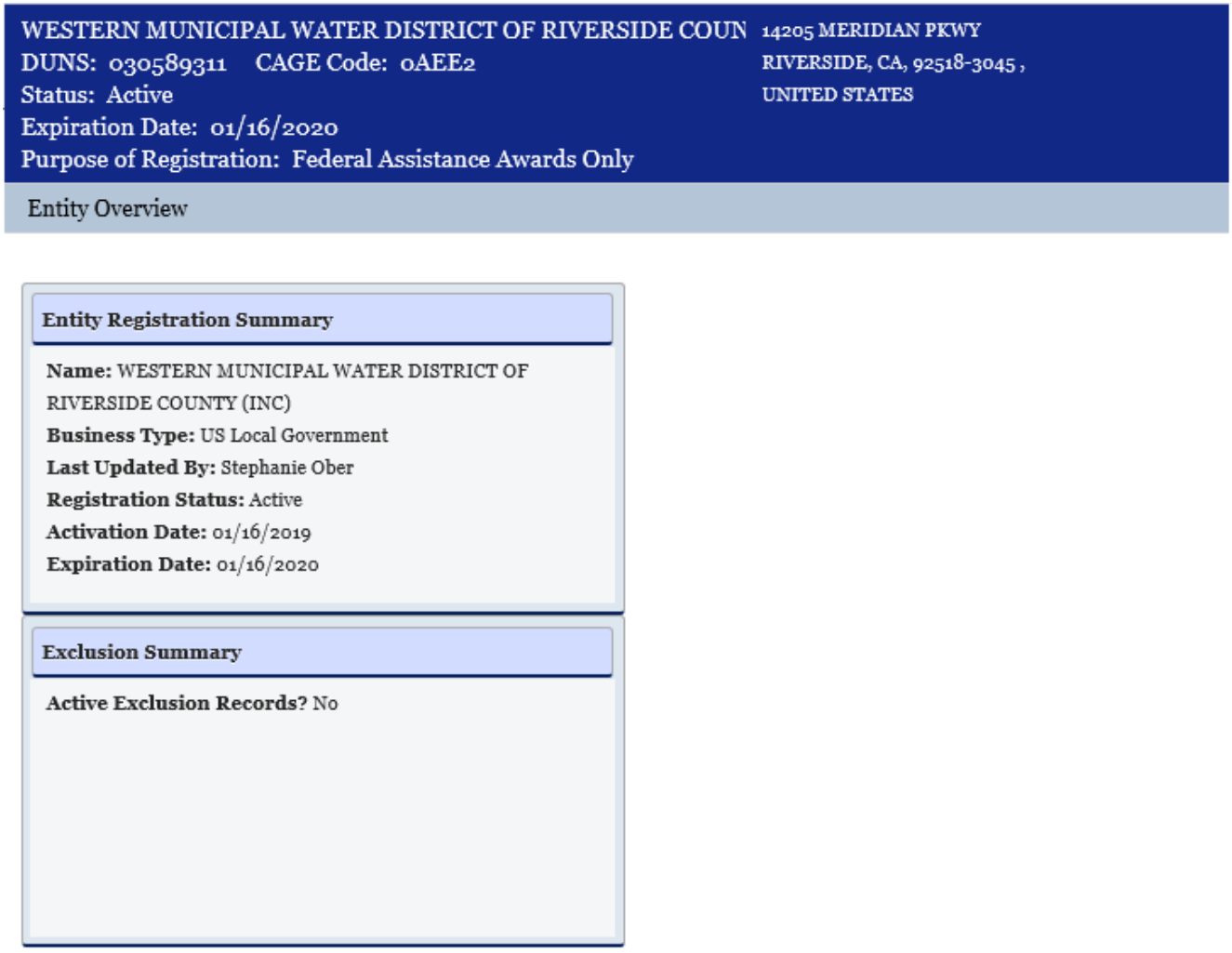
I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 3097 adopted by the Board of Directors of Western Municipal Water District of Riverside County at its Regular Meeting held September 18, 2019.

_____
S.R. "AL" LOPEZ
Secretary-Treasurer

Section 6: System for Award Management

Western Municipal Water District currently has an active registration status under the System for Award Management (SAM). Figure 2 shows the registration summary for Western.

Figure 2: System for Award Management Registration Summary



RESOLUTION 3097

RESOLUTION OF THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY AUTHORIZING THE DISTRICT'S APPLICATION, AND APPROVING NEGOTIATION AND EXECUTION OF A COOPERATIVE AGREEMENT WITH THE UNITED STATES BUREAU OF RECLAMATION FOR A WATERSMART: WATER AND ENERGY EFFICIENCY GRANT (FUNDING OPPORTUNITY NO. BOR-DO-20-F001)

WHEREAS, the Western Municipal Water District of Riverside County (Western) is a municipal water district established pursuant to Section 71000 et seq. of the California Water Code; and

WHEREAS, Western's imported water supply is facing a growing list of challenges associated with a prolonged drought on the Colorado River, Delta instability, climate change, aging infrastructure, and growing population; and

WHEREAS, the United States Bureau Department of the Interior, Bureau of Reclamation under the WaterSMART: Water and Energy Efficiency Grant Program will make funding available to qualifying applicants; and

WHEREAS, the Board of Directors of the Western Municipal Water District has identified a project that exemplifies the objectives of the WaterSMART Grant in its Phase 2: Riverside Service Area Meter Replacement and Customer Portal; and

WHEREAS, Western agrees to the administration and cost-sharing requirements of the WaterSMART grant criteria.

NOW, THEREFORE BE IT RESOLVED BY the Board of Directors that:

1) Western is hereby authorized to receive, if awarded, the WaterSMART: Water and Energy Efficiency Grant Program funding and will make a good faith effort to enter into a cooperative agreement with the Bureau of Reclamation for the receipt and administration of said grant funds; and
2) The General Manager, or his designee, is hereby authorized to take any and all action, which may be necessary for the completion and execution of the project agreement and to take any and all other action, which may be necessary for the receipt and administration of the grant funding in accordance with the requirements of the Bureau of Reclamation; and
3) This resolution officially becomes a component part of Western's grant application previously submitted to the Bureau of Reclamation; and
4) Western is capable of providing the amount of funding and/or in-kind contributions specified in the grant application funding plan; and
5) This resolution shall be effective as of the date of adoption.

ADOPTED this 18th day of September, 2019.

ROBERT STOCKTON
President

September 18, 2019

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 3097 adopted by the Board of Directors of Western Municipal Water District of Riverside County at its Regular Meeting held September 18, 2019.

S.R. "AL" LOPEZ
Secretary-Treasurer

August 20, 2019

Western Municipal Water District
Attn: Craig Miller, General Manager
14205 Meridian Parkway
Riverside, CA 92518

Rancho Water

SUBJECT: Support for Western Municipal Water District's WaterSMART Grant Application for Riverside Service Area Meter Replacement and Customer Portal Project

Dear Mr. Miller:

Western Municipal Water District (Western) submitted an application to the WaterSMART: Water and Energy Efficiency Grant (FOA No BOR-DO-20-F001) to implement Phase II of their AMI Meter Replacement and launch an Online Customer Portal. The proposed project has Western converting 7,008 of its meters that are 5 years and older to "smart" meters with advanced metering capabilities. Additionally, Western will be installing 5 Radio Antennas into Western's Murrieta Service Area that will allow the collection of meter reads to be downloaded in Western's system. Furthermore, Western will implement a subscription-based, hosted software application known generically as the "Customer Portal" which will integrate, analyze, and present meter data online to customers in near-real time. Advanced Metering Infrastructure (AMI) technology will automate meter reading, thereby reducing vehicle emissions and maximizing work force efficiency related to manual meter reading, and allow the District to manage valuable water resources more effectively, reducing the reliance on imported water supplies. AMI will also enhance customer service by empowering customers with tools to monitor water usage, identify leaks, and maximize water use efficiency. The Customer Portal will be available to over 17,000 customers with an AMI meter.

The WaterSMART: Water and Energy Efficiency grant program funds projects that result in quantifiable water savings and projects that support broader water reliability benefits. Western's proposed project has an anticipated total annual project water of 1400 acre-feet per year (AFY): 500 AFY due to leak detection and water loss and 900 AFY due to conservation, with a total lifetime savings of 21,000 AF. With 70% of Western's water imported from the State Water Project, these estimated project savings tie directly into greater water reliability for Western Municipal Water District.

As a water agency that is part of Western's service area and currently has AMI and a customer portal, we can attest to the benefits and water savings this type of project will bring. For these reasons, Rancho California Water District is proud to support Western's WaterSMART grant application for Riverside Service Area Meter Replacement and Customer Portal Project.

Very Respectfully,

RANCHO CALIFORNIA WATER DISTRICT

Jeff Armstrong
General Manager

125/KW

Santa Ana Watershed Project Authority
OVER 50 YEARS OF INNOVATION, VISION, AND WATERSHED LEADERSHIP
SAWPA

August 20, 2019

Mr. Josh German
WaterSMART Grants Program Coordinator
Bureau of Reclamation
P.O. Box 25007, MS 84-51000
Denver, CO 80225

RE: Support for Western Municipal Water District's WaterSMART Grant Application for Riverside Service Area Meter Replacement and Customer Portal Project

Dear Mr. German,

Western Municipal Water District (Western) previously applied in Fiscal Year 2019 for the WaterSMART: Water and Energy Efficiency Grant to implement Phase II of the Advanced Metering Infrastructure (AMI) Meter Replacement and launch an Online Customer Portal, collectively referred to as the Riverside Service Area Meter Replacement and Customer Portal Project (Project). The WaterSMART: Water and Energy Efficiency Grant funds projects that result in quantifiable water savings and projects that support broader water reliability benefits.

Western is now resubmitting the project under the Fiscal Year 2020 WaterSMART: Water and Energy Efficiency Grant Program. The Project includes converting 7,008 of Western's meters that are 5 years and older to "smart" meters with advanced metering capabilities. Additionally, Western would install 5 Radio Antennas into Western's Murrieta Service Area that will allow the collection of meter readings to be downloaded in Western's system. Western would implement a subscription-based, hosted software application known generically as the "Customer Portal" which will integrate, analyze, and present meter data online to customers in near-real time. AMI technology will automate meter reading, thereby reducing vehicle emissions and increasing work force efficiency. Reducing manual meter reading will identify anomalies sooner and allow the District to manage valuable water resources more effectively, reducing the reliance on imported water supplies. AMI will also enhance customer service by empowering customers with tools to monitor water usage, identify leaks, and maximize water use efficiency. The Customer Portal would be available to over 17,000 customers with an AMI meter.

The Project has an anticipated total annual water savings of 1,400 acre-feet per year (AFY): 500 AFY due to leak detection and water loss and 900 AFY due to conservation, with a total lifetime savings of 21,000 AF. With 70% of Western's water imported by the State Water Project, these estimated project savings tie directly into greater water reliability for Western.

The proposed project supports the Santa Ana River Watershed's One Water One Watershed (OWOW) objective that water waste should be prevented. A goal of the recently adopted OWOW Plan Update 2018, this region's Integrated Regional Water Management Plan, is to improve data integration, tracking, and reporting to strengthen decision making. The proposed project does this by applying new AMI technologies and a customer portal to maintain and enhance transparency and efficiency.

For these reasons, the Santa Ana Watershed Project Authority is proud to support Western's WaterSMART grant application. If you have any questions, please contact Ian Achimore, SAWPA Senior Watershed Manager at (951) 354-4233, or iachimore@sawpa.org.

Sincerely,

Richard E. Haller, P.E., ENV SP
General Manager